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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,481	11/06/2006	Toshihiko Imato	279667US0PCT	8942
22850	7590	10/22/2008	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			AKANBI, ISIAKA O	
			ART UNIT	PAPER NUMBER
			2886	
			NOTIFICATION DATE	DELIVERY MODE
			10/22/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/553,481	<b>Applicant(s)</b> IMATO ET AL.	
	<b>Examiner</b> ISIAKA O. AKANBI	<b>Art Unit</b> 2886	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>17 October 2005</u> .                                         | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Information Disclosure Statement*

The information disclosure statement filed on 17 October 2005 has been entered and considered by the examiner.

### *Drawings*

The drawings filed on 17 October 2005, has been accepted for examination.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1, 4-6 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Naya et al. (2002/0140938 A1).**

Regarding claim 1, Naya discloses a differential surface plasmon resonance measuring apparatus comprising:

(a) an incident light optical system (**figs. 1, 13, 14 and 15: 1**), wherein light (**figs. 1, 13, 14 and 15: L1**) enters at an incident angle in a range including the resonance

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angle (**resonance angle is considered to be inherent part of the system of (figs. 1, 13, 14 and 15))**(see abstract)(pars. 0006-0007);

(b) a sample setting device (**figs. 1, 13, 14 and 15: 13**) including a sample solution-fixing portion (**figs. 1, 13, 14 and 15: 15/30**) and a reference solution-fixing portion (**figs. 1, 13, 14 and 15: 15 and 15/30**) on a thin film deposited on a prism (**figs. 7 and 9: 50**)(pars. 0006, 0168), the sample solution-fixing portion and the reference solution-fixing portion lying in the region irradiated with a beam of the incident light (**pars. 0013, 0147**);

(c) a projection optical system (**figs. 13, 14 and 15: 70**) for splitting light reflected (**beam reflected at an interface 11a**) from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on a single line (**par. 0178**); and

(d) a linear CCD sensor (**photo detector means**) including a CCD on the single line, the CCD receiving the beams (**figs. 1, 13, 14 and 15: 17 and 72**)(pars. 0245, 0247 and 0250).

As to claim 4, Naya also discloses an optical interface film (fig. 7 and 9: 56) with index-matching means (**fig. 7 and 9: 52**) disposed on the prism (**figs. 7 and 9: 50**)(see abstract)(pars. 0038, 0168); and thus meet the limitation that the an adhesive optical interface film disposed on the prism, the optical interface film having a refractive index matched with the refractive index of the prism.

As to claims 5 and 11, Naya discloses a method for differentially measuring surface plasmon resonance comprising:

emitting light from a light source **(figs. 1, 7 and 9: 2)** having a specific wavelength so as to form a line focus on a sensor including a prism **(figs. 7 and 9: 50)** and a glass substrate **(pars. 0006, 0168)**;

**a measuring apparatus (figs. 1, 7, 9, 13, 14 and 15) for a surface plasmon resonance sensor for quantitatively analyzing a substance in a sample by utilizing the excitation of surface plasmon, applicant's limitation such as** generating surface plasmon resonances at sensing portions of a sample cell and a reference cell that are provided on the line focus at a predetermined distance to reduce the intensity of the light reflected from the sensing portions;

allowing the beams of the reflected light **(beam reflected at an interface 11a)** to reflect from light-splitting mirrors **(figs. 13, 14 and 15: 70)** having different angles with the beams maintaining a distance equal to the predetermined distance between the centers of the sensing portions and thus splitting the reflected light into two optical paths **(figs. 13, 14 and 15: 70-17 and 70-72)**; and

pressing an electrode-type combination sensor cell **(i.e. SPR type cell)** that is pressed at a force of about **(i.e. 20N)(figs. 1, 7, 9, 13, 14 and 15: 10 and 58** including sensing films **(figs. 1, 7, 9, 13, 14 and 15: 12 and 56)** corresponding to the sample portion **(figs. 1, 13, 14 and 15: 15/30)** and the reference portion **(figs. 1, 13, 14 and 15: 15 and 15/30)** on an adhesive optical interface film disposed on the prism **(figs. 1, 7, 9, 13, 14 and 15: 11 and 50)**, having a refractive index matched with that of the prism **((figs. 7 and 9: 52)**, whereby an optical system performing detection in two regions of a single CCD line sensor measures the surface plasmon resonances generated in the

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sample cell and the reference cell, with optical matching maintained between the sensor, the optical interface film, and the prism **(see abstract)(pars. 0038, 0132, 0168)**.

As to claim 6, Naya also discloses optical interface film such as (PMMA) that is a polymeric adhesive optical interface film (par. 0162).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 2-3 and 7-10 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Naya et al. (2002/0140938 A1) in view of Taniura (4,925,271).**

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Regarding claim 2 and 3, Naya fails to disclose the type of projection optical system which includes a plurality of mirrors for splitting the light reflected from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on the single line; and wherein the plurality of mirrors include a first mirror for reflecting the reflected light from the sample solution-fixing portion at a first angle and a second mirror for reflecting the reflected light from the reference solution-fixing portion at a second angle.

Naya discloses a projection optical system (**figs. 13, 14 and 15: 70**) for splitting light reflected (**beam reflected at an interface 11a**) from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on a single line (**par. 0178**), **and** does not limit the projection optical system to be used that includes other type of beam splitting method.

However, the use of plurality of a plurality of mirrors for splitting reflected or incident light/beam(s) into respective beams thereof and turning the directions of the beams to project the beams on the single line is common and know in the art, as evidenced by **Taniura (figs. 1a and 2a)(col. 1, lines 20-33)**.

Therefore it would have been at least obvious to one having ordinary skill in the art at the time of invention was made to substitution the Naya projection optical system for the other to achieve the predictable results of splitting the light reflected from the sample solution-fixing portion and the reference solution-fixing portion into respective

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beams thereof and turning the directions of the beams to project the beams on the single line with accuracy. Additionally, because these two projection optical system were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute the plurality of mirrors which include a first mirror for reflecting the reflected light from the sample solution-fixing portion at a first angle and a second mirror for reflecting the reflected light from the reference solution-fixing portion at a second angle for the Naya projection optical system for the purpose of separating light reflected from the sample solution-fixing portion and the reference solution-fixing portion into respective beams thereof and turning the directions of the beams to project the beams on the single line with accuracy.

As to claims 7 and 8(6/7), Naya fail to disclose the type of the polymeric film as comprising polyvinyl chloride; and wherein the sample cell is disposed on the adhesive Optical interface film without using a matching oil having the same refractive index as the prism and the glass substrate.

However, since Naya discloses polymeric film such as (PMMA)(**par. 0162**) that is widely used film, it would have been obvious to one of ordinary skill in the art because these two polymeric film were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute polymeric film such as (PMMA) for polyvinyl chloride to achieve as desired appropriate refractive index such that the polymeric adhesive optical interface film is without using a matching



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oil having the same refractive index as the prism and the glass substrate for the purpose of measuring with accuracy surface plasmon resonance effect.

As to claims 9 and 10, Naya also discloses a sample cell (**figs. 1, 13, 14 and 15: 13**) with a substance which interactive functional material and refractive index is varied by the interaction which is measured in a chemical sensor-like system; and wherein an antibody is fixed to the sample cell so that an antigen-antibody reaction is measured in an immunosensor-like system (**pars. 0147-0148**).

### **Additional Prior Art**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references listed in the attached form PTO-892 teach of other prior art a differential surface plasmon resonance measuring apparatus.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isiaka Akanbi whose telephone number is (571) 272-8658. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur R. Chowdhury can be reached on (571) 272-2287. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isiaka Akanbi

October 2, 2008

/TARIFUR R CHOWDHURY/

Supervisory Patent Examiner, Art Unit 2886